THE CASE FOR THE

SOUTHERN CROSSING

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ELMER E. ROBINSON, MAYOR

PRESENTED AT THE ASSEMBLY COMMITTEE HEARING, SACRAMENTO

MAY 7, 1949

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The Case for the

S O U T H E R N C R O S S I N G

Brief of Testimony Introduced Before the Assembly Committee on Tidelands and Related Problems at its hearing in Sacramento on May 7, 1949, on Behalf of the City and County of San Francisco

Elmer E. Robinson, Mayor

CITY and COUNTY of S A N F R A N C I S C O

Department of City Planning

Paul Oppermann, Director of Planning

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EXHIBIT PLATES

A. SOUTHERN CROSSING - Relationship to the existing Bay Bridge and the Bay Area.

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SOUTHERN CROSSING

RELATIONSHIP TO THE EXISTING BRIDGE AND THE BAY AREA

CITY AND COUNTY OF SAN FRANCISCO

PREPARED BY DEPARTMENT OF CITY PLANNING – MAY 1949

ELMER E. ROBINSON, MAYOR

A

THE CASE FOR THE SOUTHERN CROSSING

Location Problem is a Comprehensive Planning Problem

The planning and construction of a second Bay crossing is by some groups erroneously considered a highway and traffic engineering problem. This problem, although admittedly important, is but part of the larger question of soundly planning the development of each of the urban units comprising the Bay Area as a whole. It is no more possible to provide for an economically "healthy" San Francisco, separate from and unrelated to the East Bay communities and the communities to the north and south, than it is possible to plan a good residence without considering the relations of its various rooms and the means for easy and efficient circulation between them.

The position taken in this Brief by the Department of City Planning focusses upon this fundamental matter of the "rooms" of the Bay Area and their well conceived and well functioning relationships -- the relationships between the industrial, commercial, residential and public areas of many neighboring communities within an expanding metropolitan region.

The Department of City Planning is concerned not only with these relationships in their present form, based upon existing development, but with the demands which will continue to press upon the whole of the Bay Area and all its parts through the future years. This is a pressure not alone for the accommodation of larger total volumes of traffic but for a better ordering and easier flowing of whatever traffic appears and requires to be served and facilitated.

In strongly supporting the Southern crossing as being in the location which will best contribute to the preservation, on both sides of the Bay, of existing urban values of the major types mentioned, and to the upbuilding of very substantial new values in a developmental sense, the Department of City Planning does so in no spirit of opposition for the sake of opposition, and with no desire to engage in criticism. The Department does not deny, but fully grants and admires, the high competence of the State Department of Public Works in traffic and highway engineering and its pioneering contributions in its special field. The location problem of a second Bay crossing however extends far beyond the matters which directly bear upon highway traffic and bridge engineering.

The location of this new crossing will have a profound effect on the present and future physical character of San Francisco and all its closely related neighbor communities. It is not simply a question of "which is first where both are needed" but rather of the possible detrimental effect of overemphasis and resulting overcongestion of one crossing, versus the expected and claimed beneficial effect of the other. The parallel crossing will further congest areas now subjected to too intensive a burden of traffic. The southern crossing will produce, in simple graphic terms, a thinning out of too heavy traffic flows and a thickening up of lighter loads, so that over the Bay Area network as a whole, adhering to the principle of well-balanced dispersion, the "net" will carry handily many light loads spread around, instead of straining to carry a single great load dropped in its center.

The terms in which the value to the Bay Area of a project of this scale and importance must be measured, - if built at different locations - are much broader and more fundamental than the traffic it may be expected to attract within a decade or two after it is built. For in the final analysis, the moving of vehicles, or even of passengers and goods - the obvious function of highways and bridges - is but a means to more important ends: the social and economic welfare of the people of the community.

Changing the analogy: a successful operation to free a clogged artery can hardly be considered successful unless the patient is better off after the operation than he was before!

Compared with the depreciation of property values and the economic losses which this bridge may cause if in the wrong location or, conversely, compared with the new values and other economic gains it may produce if in the right location, the difference between the cheapest and the most expensive bay crossing pales into insignificance. A soundly located bridge will pay dividends to every sector of the Bay Area long after the bonds are paid off and the tolls are lifted.

The Department of Public Works takes the position that it is not within its responsibility to consider the relation of all forms of transportation to the whole of the Bay Area and its development. It may not be misstating their position to represent it as concerned very largely, if not exclusively, with free-wheeling vehicular or highway-using traffic, and the facilities, including bridge structures, needed to serve this type of traffic.

The Department of City Planning contends that other forms of transportation to serve traffic needs must be considered and balanced with highway facilities -- transit, for example, figuring importantly in any traffic solution of modern urban centers and urban regions, including this one.

As modern forms of transportation -- from canals to airplanes -- have developed, and advances in transport technology gave the opportunity for more economic and efficient transportation

facilities the opportunity was temporarily ignored and lost. Instead the new technology brought about progressively greater concentrations, and over-intensive development in some areas; with under development, economic losses and reduced efficiency elsewhere. We have been paying the heavy costs of this -- which are a charge upon business and industry and the general community as well.

The business community and public officials in major cities throughout the country are awake to the necessity of breaking with the outworn and unsound developmental policies no longer suited to the needs of modern cities. Leaders of public opinion and public action in the urban centers are aware of the opportunity as well as the urgent need to open up the congested centers. The concerted drive upon the parking problem, the rapidly growing public acceptance of the freeway principle, the support now found among highway and traffic experts -- evidenced in recent practical applications in Detroit, Chicago, and elsewhere -- for the combining within a single right-of-way of highway and transit facilities, are in point.

The development-shaping potentialities of transportation facilities to promote better balanced and otherwise more sound, economically more effective and socially more desirable distribution of population, land utilization, industry and business locations and centers are now widely recognized.

The proposal for the parallel bridge is clearly in conflict with all these important conclusions representing leading opinion and practice. The proposal seems to have been influenced by the same kind of thinking and the same kind of practices which have caused the congestion, and have caused the intolerable traffic difficulties which in turn have uprooted people, business, and industry in large numbers from our cities, swelling the so-called decentralization movement.

Thus from the broad gauge community planning standpoint, it is clear that the advocates of a parallel crossing have dealt too exclusively with the problem as if it were one merely of channeling traffic after it has been delivered to the bridge. Of equal importance is the task of relating areas which generate traffic and those which will, as developed, bring in additional amounts of traffic. These must be adjusted to a well articulated, broadly distributed and balanced system of highways and public transportation services and facilities of every modern type. The planning of the facilities that handle traffic and the planning of the facilities that generate traffic must be coordinated. Otherwise we may find ourselves in the Bay Area in a predicament like that of the officials having authority to make decisions affecting the treatment of the lower Mississippi River: they tried to deal with floods in the main river by building higher and higher dykes, without taking steps to balance and regulate the numerous sources or generators of the big flood before it descended upon them.

Transit Need Should Not Be Ignored

The construction of so costly a project as a second Bay crossing, a project of such magnitude and long service-life, ought to accomplish a great deal more than merely the relief of an overcrowded thoroughfare. The congestion on the present Bay Bridge is only one aspect of the pressing problems with which citizens of the Bay Area are now faced. On both sides of the Bay the intensive use of the central areas is already placing a severe strain upon the street systems and upon other utilities which are being used at or near capacity. High land values make off-street parking almost prohibitive in cost. The flooding of the areas with vehicles is tending toward the point of saturation.

In Oakland and in San Francisco, the tremendous and essential importance of retaining the drawing power of the Central Business Districts is well understood. But as the difficulty of doing business increases there is emerging a real threat to property values in these areas. What the central areas need for continuing success is convenient accessibility to people from the whole region; but not a further increase in the number of vehicles entering and passing through them.

Hence, a basic principle is that remedies must be sought for the decreasing riding habit on the Bay Bridge trains. Rapid transit facilities must be improved. If rail facilities are now but half used, the conclusion to be drawn is not that capacity is ample, but that use is deficient. To further increase the vehicle-carrying capacity by constructing a parallel Bay Bridge would do nothing to solve this problem, but would intensify it, particularly during the rush hours.

Once the vital importance of giving immediate attention to this problem of increasing the proportion of transit riders is established, the true functions of a second vehicular crossing can be objectively analyzed. The proposed expenditure of over $150 millions will be justified not only because of the traffic which will use it, but because it creates the opportunity for new development. Parts of the Bay Area hitherto retarded, because less accessible to workers and less attractive to industry, may be brought into full development.

Only a Southern Crossing Will Stimulate Development

A bridge so located will develop new and lasting values at both ends and at the same time safeguard present values in the central areas. It will stimulate new industries, thus generating new traffic, and will add through a long period of years to the real wealth of the community.

This detracts nothing from the sound values of central areas already served, and keeps no worker or shopper from going

to the center. On the contrary it makes access to the central areas easier, and lessens the risk that the central areas may be strangled by an excess of the very thing upon which they depend for prosperity. As the region grows and prospers, so does the central area, but not by the futile process of loading its own limited and intensively used land area with transient vehicles, or by excessively piling up industry and commerce to the strangulation point.

It is a better policy, of which the advantages will be more and more evident in the years to come, to encourage more intensive uses of areas now backward, where there is a usable margin of facilities of various sorts to serve them. This applies to industries, which are sources of new traffic, and to the residential areas whence the workers come as well.

It should be recognized that on both sides of the Bay the areas of greatest future growth lie to the south, and the tremendous possibilities of development there await only the impetus of easy approach. Here the imagination must penetrate, not by extending curves of population or traffic forward only a decade or two, as the Department of Public Works has done, but boldly into the middle of the life span of such a structure as is proposed. The objective must not be simply to provide more vehicular access to areas already well served, but at the same time to open up new services to these new areas, so that the Bay Area as a whole may thrive and prosper.

No one will think of asserting that the phenomenal growth of Hayward has reduced values in Downtown Oakland, or that the development of San Mateo County has injured Downtown San Francisco. On the contrary, this outlying growth has increased the importance of the inner areas and has contributed to their prosperity. A new bridge in a new location can no more be a detriment to these great business centers than were the outlying areas in the process of their growth. Rather it will help to protect the central areas and preserve them from threatening over-intensive use.

A very large proportion of the vehicles which daily cross the Bay is not destined to either the San Francisco or Oakland central business area. These vehicles are thus only in the way so far as access to the central areas is concerned.

Experience has demonstrated in many cities that the only lasting relief of traffic congestion lies in providing well located new thoroughfares so as to bring about a better distribution and balancing of the various major types of land use. This means, not decentralization of the natural and proper functions of central business districts, but rather freeing the land within such districts for their established legitimate functions by encouraging a lesser concentration in central locations by the other types of uses.

The construction of a Southern Crossing provides an extraordinary opportunity to accomplish this. The Army-Navy Board concluded that this one consideration alone was sufficient to rule out the parallel bridge.

Thus, while it is true that the immediate pressing need for an additional bridge arises out of the approaching saturation of the existing Bay Bridge, the general considerations outlined relate to lasting benefits of a far more important character than simply service to traffic alone. To disregard such considerations and to develop conclusions based largely upon the narrower concept that traffic congestion can be substantially and permanently relieved merely by increasing the capacity of engineering structures is a most serious error. If the future prosperity of the entire Bay Area is not made the determining factor, rather than such items as the ease of toll collections or the rapidity with which plans can be drawn, a grave injustice will have been done, not only to the users of the crossing, but to every citizen of the Area for generations to come.

These are basic reasons for the position taken by the City and County of San Francisco on the question of the location of a second Bay crossing. They are the compelling reasons, but not the only reasons for which the Department of City Planning has consistently supported a location south of the present bridge. The California Toll Bridge Authority, accepting the recommendations of the California Department of Public Works, on the other hand, has directed that construction be expedited on a bridge parallel to and identical to the present bridge. Therefore it is an additional purpose of this Brief to point out some of the fallacies and false assumptions among the reasons advanced by the Department of Public Works in behalf of their recommendations, and to present in further detail some of the advantages of a southern crossing.

Parallel Crossing Violates Many Planning Principles

In presenting the case for a Southern Crossing to your committee, it should be emphasized that the Department of Public Works has had available to its Toll Crossing Division, for development of its plans and presentation, the sum of $1,450,000. The preparation of the entire transportation plan for San Francisco has entailed the expenditure of less than $200,000. Actual expenditures on the question of a Second Bay Crossing by the Army-Navy Board were $23,000. The City and County of San Francisco has spent nothing directly on the subject. San Francisco cannot be expected, therefore, to present either specific plans developed to the degree of preciseness of those presented by the State Department of Public Works, nor to present detailed data in the form of tables and diagrams. But the principles on which the Department of City Planning is basing its case for a southern crossing are much broader and far-reaching than the estimates of numbers of vehicles to enter or leave a given ramp during a peak hour in a given year before 1970. It is the broad principles which the Department of City Planning is here restating and reaffirming. But some obvious violations of these principles contained in the plans of the Department of Public Works are pointed out.

Our purpose in expressing at some length the strong convictions we hold as to the incorrectness of the underlying assumptions made, and of certain design features recommended, by the State Department of Public Works requires, however, a word of clarification. Taken separately they are, perhaps, details; although to San Francisco they are vital details. Some, it will be argued, could be met by adjustments; others will be lightly claimed to be irrelevant to the immediate issue.

But the inescapable fact is that, taken collectively, they most seriously affect the validity of the conclusions reached. For each one of them tends either (1) to improperly increase the apparent cost of the Southern Crossing, (2) to lessen the apparent, but not the real, cost of the Parallel Bridge; or (3) to adversely affect the estimates of traffic that would use the Southern Crossing.

The Department of Public Works has advocated the construction of a parallel bridge since publication of its Report to the California Toll Bridge Authority Covering Preliminary Studies for an Additional Bridge Between San Francisco and the East Bay Metropolitan Area, on January 31, 1947. Since this recommendation followed by one week the recommendation of the Joint Army-Navy Board in its report on An Additional Crossing of San Francisco Bay that a second crossing be built in a southern location, it was modified by the Director of the Department of Public Works on November 10, 1947, when he recommended to the Toll Bridge Authority that both the parallel bridge and the southern crossing be built. In recommending to the Toll Bridge Authority, on March 23, 1949, that a parallel bridge be financed and constructed first, as recommended in the report submitted by the Toll Crossings Division of the Department in November

1948, the Director said:

"The desirability of both crossings is recognized, but it is, in my opinion, not possible to finance both crossings at this time by revenue bonds."

To this it must be said: it is and always has been the position of the City Planning Commission of San Francisco that a parallel crossing is undesirable, whether constructed immediately or as a third crossing at a later date.

Governor Warren, when voting in favor of a parallel crossing as chairman of the Toll Bridge Authority, implied that there is no basic disagreement between the diametrically opposing recommendations of the Department of Public Works and the Joint Army-Navy Board. He said, as reported in California Highways and Public Works, March-April 1949: "Although the Army-Navy Board recommended a southern crossing and the Department of Public Works a parallel bridge, the two reports were not at such variance as that fact might imply. Each of them found that both such crossings are feasible and will be required for the future. . . . This is not a question of conflict between the two agencies. It is a question of the emphasis to be placed on the complicated needs of one of the fastest growing areas in America."

This is a very misleading statement. The Army-Navy Board did not acknowledge the necessity for a parallel vehicular bridge nor did it imply that it approved of such a structure. Rather it gave specific reasons for not recommending such a structure. An nowhere in the report of the Joint Army-Navy Board is there any implication that it was considering merely the question of priority of construction as between a parallel bridge and a southern crossing.

The purpose of the Joint Army-Navy Board was to determine the need and feasibility from either the standpoint of national defense or the development of the peacetime economy, or both, of construction of either a bridge or a system of dams across San Francisco Bay as a solution of the cross-bay traffic problem, and to investigate all locations and types of crossings necessary, in order to recommend that which it considered the best. It did not recommend a parallel crossing. In fact it pointed to basic principles of traffic dispersion, calculated to definitely rule out the twin bridge, and which, in its view, are so important as to be controlling.

It is obvious, from the position taken by the Toll Bridge Authority, that although it has based its position on conclusions reached by an ostensibly impartial study, it has failed to heed the principles cited which support a southern crossing. The Department of Public Works has condemned the southern crossing on the basis of short-sighted, short-term, and often erroneous assumptions, ignoring the officially expressed convictions of both local and non-local authorities.

Low Proportion of Traffic Diverted Due to Faulty Approaches.

The Department of Public Works claims as a result of its analysis of the origin-destination data obtained in the Bay Area Metropolitan Traffic Survey, made in 1946 and 1947, and on the basis of its projections to 1970 of population growth, automobile registration, and gasoline usage, that 82 percent of the traffic would be better served by a parallel crossing and only 18 percent by a southern crossing. But the study assumed a pattern of freeways and approaches conceived before the need for a second crossing was analyzed and accepted. Its system of freeways and major streets and approaches, therefore, was designed to support and relate to the existing bridge. Likewise this system would badly serve a second bridge in a southern location. The southern crossing, reluctantly espoused by the Department as a necessary link in the long range Areawide system of freeways, was treated as an appendage and no modifications were made in the freeway pattern, in spite of published Master Plans of Oakland and San Francisco, which would have entirely changed the allocation of traffic.

Although the Division of Toll Crossings had a total of $1,450,000 appropriated to it for its detailed study of the two bridge sites, compared with a sum of $23,000 at the disposal of the Joint Army-Navy Board, no effort was made by the Toll Crossings Division to modify the details of the plan recommended by the Army-Navy Board in order to improve its serviceability, nor to modify either the pattern or the construction schedule of freeways to provide accessibility to the southern crossing.

Reference is made to Exhibit I, showing the freeways and approaches assumed by the Department of Public Works to be available by 1960, either as gas tax financed facilities or as approaches to the southern crossing financed by revenue bonds. The design is obviously prejudicial to the maximum use of the Southern crossing. Note, for instance, that there is no direct freeway connection between the southern crossing and the Eastshore Freeway for traffic bound to and from the west and north. On the San Francisco side, a similar restriction of freedom of movement is imposed for southern crossing traffic bound to or from the north on the Bayshore Freeway. Instead of being integrated into the Areawide pattern of freeways, the southern crossing is treated as an appendage connecting with the approach structures of the present bridge. Under this handicap, there can be little quarrel with the assignment of traffic derived by Coverdale & Colpitts.

Ignored by the Department of Public Works is the master plan of thoroughfares adopted by the cities of Oakland and Alameda, which look toward a freeway and thoroughfare pattern adequately designed to distribute traffic to and from the southern crossing. (See Exhibit II). The case made for the parallel bridge is made on the basis of seemingly plausible conclusions reached by an objectively conducted study and analysis utilizing incontrovertible data. But the use of, and conclusions drawn from, such data are largely conjectural, because the unpredictable factor of human behaviour and movement is paramount in such a study, and in an effort to restrict the freedom of such human movement

and physical
a distribution pattern was utilized which offers psychological/
blocks to the widespread use of the southern crossing. That a
better system could be developed, and has been so developed by
the cities of San Francisco, Oakland, and Alameda, is not denied
by the Department of Public Works; the possibilities of such a
system are simply ignored.

As the Joint Army-Navy Board said in its report: "Vehicular crossing facilities can be located according to one of two principles: Either by providing a crossing which will directly connect the centers of demand of the total area on each side of the Bay, or by dividing the areas of demand on either side of the Bay into equal parts so that the present bridge connects the centers of demand of one of these parts on each side of the Bay, and the proposed crossing or crossings, each connect the remaining pair, or pairs, of areas . . . . A crossing located in accordance with the first principle concentrates traffic and fosters congestion to an undesirable degree. A long-range plan for the solution of the cross-bay transportation problem should, therefore, be based on the second principle."

Reference is made to Exhibits III & IV showing desire lines of vehicular traffic between the San Francisco side of the Bay and the East Bay cities, derived from the origin-destination data compiled by the Bay Area Metropolitan Traffic Survey. The lines shown are based on 1970 movements. Exhibit III shows all transbay traffic destined to and originating in the San Francisco Metropolitan Traffic District. This movement constitutes 45 percent of the total transbay movement. Exhibit IV shows the traffic movements from the area in San Francisco outside the Metropolitan Traffic District to the East Bay. Almost all of this traffic, constituting 55 percent of the total transbay movements, would be as well served or better served by the southern crossing, utilizing the designed pattern of freeways and thoroughfares officially adopted by the cities of Oakland and Alameda, and planned for incorporation into the San Francisco master plan.

In summary, the reason cited for the parallel bridge that it will better serve 82 percent of the traffic that will use it is based on previously mentioned assumptions as to a network of freeways designed to serve the present bridge. If the Department of Public Works accepts the southern crossing as ultimately necessary, there is no justification in its position of disregarding the approach requirements of the southern bridge, which have been officially recognized by Oakland and Alameda and in the projected plans of San Francisco. The approach route following Fifth Street in Alameda, for instance, has been criticized for it would practically isolate one residential section from the rest of Alameda. Moving the route to Main Street, as provided in the master plan of Alameda, so that the freeway would separate the residential communities from the naval installations, would have a beneficial effect upon the growth and development of Alameda, and would recognize the useful community-shaping aspects of freeways.

Parallel Bridge Ramps Will Cause Congestion

The approach system and ramps proposed for the parallel bridge plan are claimed to solve all possible problems of congestion on the approaches and on the city streets of San Francisco. For the parallel bridge two off-ramps are provided which are included as a part of the costs of the parallel bridge. Two additional off-ramps are provided, but they are charged to the Bayshore Freeway. One off-ramp used by the existing bridge would be available to the parallel bridge. Thus out of a total of five off-ramps only two are charged to and included in the cost of the parallel bridge!

Three on-ramps are provided, charged to the parallel bridge. Two additional ramps are charged to the Bayshore Freeway. One ramp used by the existing bridge will be available. Of a total of six on-ramps only three are charged to and included in the cost of the parallel bridge. Figures are cited by the Department of Public Works showing projected traffic which will use all the ramps, showing combined transbay and Bayshore Freeway traffic jointly using such ramps. It is stated by the Department of Public Works that in addition to serving transbay and Bayshore Freeway traffic the proposed approach system will be utilized by local traffic, further relieving congestion on local streets, but such traffic is not estimated, nor is it shown on the volume totals shown for each ramp. It is the contention of the Department of City Planning that this approach system is totally inadequate.

On page 68 of the Tudor report it is said of the present Harrison and Fremont ramp and of the First and Clementina ramp that "these two carry approximately 50 percent of the total bridge traffic and produce serious congestion in the adjacent city streets during peak periods." On page 72 of the same report it is stated that "The amount of bridge traffic alone now handled at First and Clementina (off) and at Fremont and Harrison Streets (on) is but slightly less than the combined bridge and freeway traffic that will be handled at the busiest ramps in 1955." Thus, by their own statements, the Department of Public Works is showing that congestion will occur on local streets as a result of the design of the approach system, which, on the other hand, they claim will relieve congestion!

To cite one example of what is in effect "planned" congestion, for the year 1955 the Department of Public Works shows an estimated 2229 vehicles entering the approach structure at 13th Street and South Van Ness Avenue. This provides a very serious and destructive compounding of congestion with congestion, for both South Van Ness Avenue and Howard Street, which come together at 13th Street, are carrying capacity traffic loads now.

South Van Ness Avenue, between Mission and Howard Streets, now carries approximately 1600 vehicles per hour in the peak hour southbound, while Howard Street here carries 1000 vehicles per hour in the same direction (Source: Traffic Counts made by Division of Highways and Departments of City Planning and Public Works, January-February 1948). The proposed ramp must be entered

from South Van Ness Avenue south of the point where the two surface traffic streams merge, but present volumes are at capacity level. The addition of 2229 vehicles to that traffic stream denies the claim that this will be a congestion-free approach system.

Nor can the on- and off-ramps of the approach system be defined as being adequate in design. Actually they violate many accepted principles. In the joint report submitted to the State Department of Public Works in December, 1946 by the San Francisco Department of Public Works and the San Francisco City Planning Commission it was established that: "No outlet is acceptable which is so designed that traffic will immediately encounter an opposing or intersecting flow requiring the use of signals at the exit. Outlets must provide amply for deceleration after leaving the main approach structure and for easy merging of the outflow with a parallel flow of local traffic in order to avoid delay or a backing up of accumulated vehicles on the bridge proper." This principle is strongly reaffirmed at this time by the Department of City Planning. But the approach system designed by the Department of Public Works, and presented as a solution to problems of congestion, provides ramps on both Harrison and Bryant Streets at Fourth, Fifth, Seventh, and Eighth Streets, and on Mission at Main and Beale Streets, which require not two-cycle but three-cycle signal controls at the intersections, restricting by one-third to one-half the capacity of the streets to carry local surface traffic.

Furthermore, the one-way street plan of San Francisco, geared to the Bayshore Freeway as projected before completion of the Department of Public Works bridge study, provides for making Seventh and Eighth Streets one-way: Eighth Street one-way southbound, and Seventh Street one-way northbound. Under the approach plan as designed by the Department of Public Works, the on-ramp for Bayshore Freeway traffic is at Seventh and Harrison, an extremely awkward location with Seventh Street one-way northbound. With Harrison and Bryant Streets both functioning as one-way streets, Harrison would be carrying about 2550 vehicles westbound (at present volume levels) at Seventh Street.

As most of the traffic would approach this ramp from Harrison, adding the 1260 vehicles allocated to the ramp by the Department of Public Works to the 2550 now carried by Harrison, that street, with an optimum capacity of 3000 vehicles per hour one-way, would be overloaded by 810 vehicles. This is at present - day levels, allowing for no future expansion of traffic volumes.

Similarly an awkward situation develops at Eighth and Harrison where an off-ramp enters southbound Eighth Street in a northbound direction. Thus all northbound traffic is channeled into Harrison instead of being able to use Eighth Street as well.

Another awkward feature of the interchange plan results from the requirement that all Harrison traffic entering the Bayshore Freeway to proceed south must cross Seventh Street, which will be a heavy one-way artery. Northbound traffic leaving the Bayshore Freeway at Seventh Street, proceeding north on Seventh Street,

must cross paths with all traffic bound south via the Bayshore Freeway. This is the type of situation now prevailing at First and Clementina Streets, one of the highest accident rate intersections of the city.

The same type of situation characterizes the approach system provided by the Department of Public Works at Eighth and Harrison Streets. To claim that this approach system will relieve congestion is untenable.

No direct connection to The Embarcadero is provided as a part of the parallel bridge approaches. It is implied by the Department of Public Works, however, that such a connection will be available by 1960, constructed from gas tax funds. Coverdale and Colpitts in their Report on Estimated Traffic and Earnings of Existing and Additional San Francisco Bay Toll Crossings in Exhibits K-3 and K-4 assign one-half of the 1960 Main-Beale ramp traffic to The Embarcadero ramp connection making it rank second in importance to the South Van Ness Avenue-13th Street ramp in total volume of traffic. Yet this important connection is not included in the costs of the parallel bridge. Its important ranking substantiates the position of San Francisco that a marginal freeway connection to the southern crossing is essential.

The Embarcadero Freeway is a Basic Element in the San Francisco Master Plan

In comparing the Tennessee Street-6½ Street Freeway route with the Embarcadero Freeway route, the Toll Crossings Division of the Department of Public Works states in its report (page 79) that "The Tennessee Street-6½ Street plan is less expensive by approximately $11,000,000. As will be shown later in this report costs of this crossing must be kept to a minimum to offer any chance of financing".

The Embarcadero route is the more desirable route from the standpoint of dispersal of traffic from the two bridges, and would lead to distributive streets on the eastern edge of the San Francisco Metropolitan Traffic District not now filled to capacity, and would avoid crossings of Market Street -- the congested bottleneck to internal traffic flow in the Metropolitan Traffic District. Thus it is the route always officially favored by the San Francisco Department of City Planning and contained in the officially adopted Master Plan of San Francisco. Therefore, further information regarding this cost differential was sought from the Toll Crossings Division.

The cost of construction for the Tennessee-Embarcadero Freeway, as designed by the Toll Crossings Division, including a 135-foot high-level span over China Basin, is $20,600,000. This figure included $2,800,000 for the high-level bridge over China Basin, which structure results in high construction costs for the entire freeway, with no possible ramp connections from the Freeway to adjoining waterfront thoroughfares, thus minimizing the local utility of this expensive structure. A low-level route, involving cheaper construction costs could be developed following an alig-

ment west of Fourth Street and paralleling the Southern Pacific tracks. No engineering studies of this cheaper and more useful route were made by the Department of Public Works.

Against the cost of $20,600,000 for the Embarcadero route as shown in the Toll Crossings Division report, the cost of the Tennessee Street-6½ Street route from the Southern Crossing to Harrison Street only is $10,560,000, resulting in an actual difference of $10,040,000, rather than the $11,000,000 cited by the Department of Public Works in its report.

But, added to the Tennessee Street-6½ Street route in the plan for the southern crossing is $3,950,000 for construction of the Main and Beale Street ramps. Right of way costs for the Tennessee-6½ Street-Main and Beale ramp route are $10,623,000 (cited in a letter to H. C. Vensano from B. W. Booker, District Engineer-Administration, State Division of Highways, dated January 4, 1949). Right of way costs for the Embarcadero route as shown are conservatively estimated at $3,960,000 by the Department of City Planning. (An estimate of $980,000 for a similar freeway route was made by Woodruff & Sampson in a report on the location, design and estimates of cost of the Marginal Freeway submitted to the City Planning Commission on August 30, 1945.) The higher estimate made now by the Department of City Planning is more comparable with that of the Toll Crossings Division.

Adding in all ramps and connections to the 6½-Tennessee route to make it nearly comparable to the Embarcadero route, and adding the right-of-way costs of the two routes the comparative costs of the two routes are $24,560,000 for the Embarcadero route and $25,133,000 for the 6½-Tennessee route.

It is thus shown that the Embarcadero route is cheaper than the Tennessee-6½ route, and it is contended that detailed engineering studies to further reduce the costs of this route can be made. The high construction cost is occasioned by a type of design unnecessary and unwarranted by actual conditions of use of the China Basin and the Channel.

Unnecessary Costs Added to Southern Crossing

It is here contended that the Department of Public Works has saddled the southern crossing, in its study, with unnecessary charges, some of which have absolutely no validity as part of the Southern Crossing.

On Page 76 of the Tudor report it is stated that "In order that the Southern Crossing may effectively serve traffic. . . certain additions to the ramp system on the existing San Francisco-Oakland Bay Bridge will be constructed. As no other agency has authority and assured funds to provide these items, it appears that the Toll Bridge Authority must do so as a part of the Southern Crossing." Considering these assumptions, which we seriously challenge, it is not surprising that the

Southern Crossing does not compare favorably from a cost standpoint, when it must pay for improvements to remedy deficiencies in the present bridge.

The $11,000,000 difference in cost cited between the two Marginal routes, which actually does not exist, was cited so that the less advantageous 6½ Street route could be utilized to improve the approaches to the existing bridge. For, in the last analysis, considering the position taken by the Department of Public Works, there is not a little reason to wonder if the parallel crossing is so strongly advocated in order to make possible the correction of mistakes and deficiencies on the present bridge without directly charging them as such. Exhibit V, for example, shows one ramp section serving the existing bridge solely, which is charged to the southern crossing.

The Army Street Freeway would cost $7,729,000 for construction and right-of-way according to the Department of Public Works estimates. Yet the traffic which this freeway would carry, designed as it is to connect only to the south on the Bayshore Freeway is not sufficient to justify freeway construction. That such was the case was recognized in the transportation study conducted for San Francisco by De Leuw Cather and Company, and Army Street is shown on the recommended plan as a major surface street only. Coverdale & Colpitts finds the traffic which the Army Street Freeway would carry to be so small that figures are not even shown in their exhibits showing peak hour traffic capacities on the various sections of the approaches and ramps to the southern crossing. The cost of $7,72 9,000 is an unnecessary charge added to the Southern Crossing.

Southern Crossing Can Fit into Areawide Plan

This honorable committee has before it a problem of far-reaching importance. In our presentation before you our purpose has been to modify and correct the incorrect view that construction of a parallel bridge across the Bay will meet the future traffic requirements of the closely linked communities of the Bay Area, and to substitute the correct view that the needs of these communities in the near future will call for a broad transportation plan linking all the portions of this great metropolitan area so as to stimulate and soundly influence efficient and convenient transportation and traffic flow. The southern crossing is an integral and indispensible element in this broadly based practical objective.

It is most respectfully urged here by the City and County of San Francisco that the report favoring construction of a parallel bridge be critically reviewed in the light of the numerous and serious fallacies it has been shown to contain; and that it not be taken as the last word on so important a matter.

We are confident that your committee will consider carefully the fundamental principles and the basically sound objectives which it has been our privilege to outline. After doing so, we believe that

your committee will conclude that two bridges are better than one and a half, that the southern crossing should be constructed at once, and that immediate and concerted efforts should be made to secure such improvements in transbay public transit as will effectively and permanently increase the convenience and comfort of daily access to downtown San Francisco.

SECOND BAY CROSSING:
SUMMARY OF STATEMENT MADE BY CHARLES E. DE LEUW, TRANSPORTATION CONSULTANT, AT THE LEGISLATIVE COMMITTEE HEARING IN SACRAMENTO ON May 9, 1949.

Previous statements made to your Committee have developed the fallacies in certain of the assumptions made by the Division of San Francisco Bay Toll Crossings of the California Department of Public Works on which the traffic estimates of Coverdale & Colpitts, Consulting Engineers of New York City, were based.

Mention has been made of the failure to include the entire metropolitan area in the Bay Area Metropolitan Traffic Survey conducted by the State Highway Department in cooperation with the Public Roads Administration in 1946 and 1947. Mention has also been made of the presumption that there would be no improvements in public transit facilities as now operated, and that traffic on existing transbay transit facilities would remain at the present level. Emphasis has also been given to the fact that the Coverdale & Colpitts traffic estimates were developed in the absence of any long range or comprehensive plans for highway development in the metropolitan area and that - as a matter of fact - the interchanges with the rather meagre pattern of freeways which was utilized in these estimates were so designed as to discourage the use of the Southern Crossing.

I will not attempt to enlarge here on these important matters but will limit my statement to your Committee to my own analysis of the capacity and use of the existing bridge and the proposed Southern Crossing.

I desire to make it entirely clear that my comments are not to be construed as any reflection on the very excellent engineering organization of the California Division of Highways. Neither is there any reflection on the high professional standing and competence of the firm of Coverdale & Colpitts. We have reviewed in some detail the methods utilized in the BAMTS, and have had available for our use many of the data developed in that survey from which we can state that the survey was conducted in an efficient and capable manner so that complete confidence may be placed in the basic data developed.

Similarly, we have reviewed the techniques and procedures utilized by Messrs. Coverdale & Colpitts as described in their report of November 1, 1948, and find that we are generally in accord not only with the techniques utilized in the estimates of traffic but also in their projections of future trends. We have, however, as previously stated, certain criticisms of the basic assumptions utilized in developing these traffic estimates. More important, perhaps, are the differences in the conclusions reached by Coverdale & Colpitts and myself in respect to the capacity and use of the two crossings, and I will attempt to develop this point in some detail.

In order to avoid confusion I will utilize the allocation of traffic between the existing bridge and the Southern Crossing as well as the projections of traffic increases to the year 1970 as made by Coverdal & Colpitts. In the following discussion all references to estimates and page numbers will be to those appearing in Messrs. Coverdale & Colpitts Report of November 1, 1948.

Total revenue vehicles in 1970 are estimated at 38,469,000 (see page 40). On page 70, it was stated that total vehicles - including both revenue and non-revenue vehicles - would be determined by dividing total revenue vehicles by 0.975. Making the reasonable assumption that this relationship will remain, it may be determined that the total vehicles during the year 1970 will amount to 39,500,000.

On page 70, light passenger vehicles utilizing the upper deck of the existing bridge were stated to be 90.61% of the total traffic. Making the reasonable assumption that this ratio will remain constant it may be determined that the total light passenger cars in the year 1970 will be 35,700,000, and that buses and trucks will total 3,800,000.

In the table opposite page 109 summarizing the Coverdale & Colpitts estimates, it was stated that 17.9% of the total traffic will utilize the Southern Crossing on "basis of present pattern, and time and distance saving." They also estimated additional traffic over the Southern Crossing resulting from "other diversions from zone-to-zone movements where time-saving may not be the sole determinant" at 831,000 cars or 2.2% of total. Thus, the total traffic over the Southern Crossing was estimated at 20.1%. My estimate of the total use of the two crossings is shown in the following tabulation:

	Existing Bridge	Southern Crossing
Light Passenger Cars	28,500,000	7,200,000
Induced Traffic°	-	240,000
Trucks and Buses	3,030,000	770,000
	31,530,000	8,210,000

°From tabulation opposite page 109

The relationship between total annual traffic and normal week-day traffic was summarized on pages 50 and 51 of the report, where normal week-day light passenger car traffic was stated to be 1/370 of the total annual traffic, and normal week-day bus and truck traffic 1/300 of the total annual traffic. Applying these factors to the figures for total annual traffic in the year 1970 previously discussed, it is determined that average week-day light passenger car traffic in the year 1970 will total 97,000 vehicles, and that the average week-day truck and bus traffic in the year 1970 will total 12,500 vehicles. Allocating 20.1% of the traffic to the Southern Crossing it develops that there would normally be 77,000 light passenger cars and 10,000 trucks and buses - a total of 87,000 vehicles over the present bridge. Similarly, there would be 20,000 light passenger cars and 2,500 trucks and buses, a total of 22,500 over the Southern Crossing.

Exhibit R-2 shows a graph of hourly directional traffic based on traffic counts made on the upper deck of the existing bridge on three week days in 1948, and was used as a basis for the determination of peak hour traffic conditions at the 1970 traffic level. (This will produce slightly higher figures for peak hour traffic than may be reasonably presumed due to the tendency of these curves to flatten with increases in traffic as stated in the report). Maximum hourly traffic reaches a peak during the eastbound p.m. period of 6% of the twenty-four hour total. Bus and truck traffic reaches a similar peak of 5%. Applying these percentages to the average 1970 week-day traffic, we find that

the maximum traffic in one direction in a single hour over both crossings will total approximately 5,800 light passenger cars. However, 20.1% will be diverted to the Southern Crossing so as to reduce this peak flow over the existing bridge to approximately 4,600 light passenger cars, and during the same hour the flow over the Southern Crossing would be 1,200 light passenger cars.

Messrs. Coverdale & Colpitts stated the practical capacity of three lanes of the upper deck of the existing bridge to be 4,200 vehicles per hour and the "comfortable" capacity to be 3,000 vehicles per hour. In view of the known peak figures on the present bridge of more than 4,400 vehicles per hour; of the higher rates of traffic flow both on the existing bridge and in many other localities for shorter periods ranging up to 2,000 vehicles per lane per hour, it is my opinion that the figures utilized by Coverdale & Colpitts are unreasonably conservative. It is my opinion that 1,200 vehicles per lane or a total of 3,600 vehicles per hour is a more reasonable assumption as to the comfortable capacity of three lanes on the present bridge structure.

Utilizing this figure and applying it to an enlargement of Exhibit R-2 (attached hereto) it may be determined that a diversion of light passenger cars to the Southern Crossing during the evening peak period of 1,325 vehicles and during the morning peak period of 825 vehicles would limit the 1970 use of the upper deck to the comfortable capacity of that structure as now operated.

During the maximum hour of the same eastbound peak period the flow over the Southern Crossing in the eastbound direction would amount to 6% of 20,000 light passonger cars or 1,200 vehicles plus 5% of 2,500 trucks and buses or 125 plus 1,025 light passenger cars diverted from the existing bridge, making a total of 2,350 vehicles in the eastbound direction. This amounts to an average of 783 vehicles on each of the three lanes proposed for the causeway and an average 588 vehicles for each of the four lanes in the tunnels. These figures are well within the limit of the capacity of the Southern Crossing.

In the westbound direction during the same evening peak hour period, the total traffic as developed from the same curves would amount to only 890 vehicles which is an average of 297 vehicles on each of the three lanes available on the causeway, and an average 445 vehicles on each of the two lanes available through the tunnel section.

Estimates to the year 1980 have been made, based on curves projected by Messrs. Coverdale & Colpitts, which establish the increments to traffic during this ten year period at approximately 13 percent. Thus the total eastbound traffic during the evening peak period is estimated as follows:

	Maximum Hour Traffic - 1980	
Crossing	Total	Per Lane
Existing Bridge	3,600	1,200
Southern Crossing	3,124	
Causeway Section		1,041
Tunnel Section		781

A comparison of traffic flow through the Posey Tube in Alameda during the year 1947 with that estimated by Messrs. Coverdale & Colpitts for the year 1970 for the Southern Crossing is shown in the following tabulation:

Tunnel	Number of Lanes	Maximum Hourly Traffic Heavy Direction Total	Maximum Hourly Traffic Heavy Direction Per Lane	Maximum Hourly Traffic Total	24-Hour Total
Posey Tube	2	1,178	1,178	2,201	28,000
Southern Crossing	6	2,350	588°	3,240	24,650

°Four lanes available during rush hour.

Certain facts became clear from the foregoing analysis, as follows:

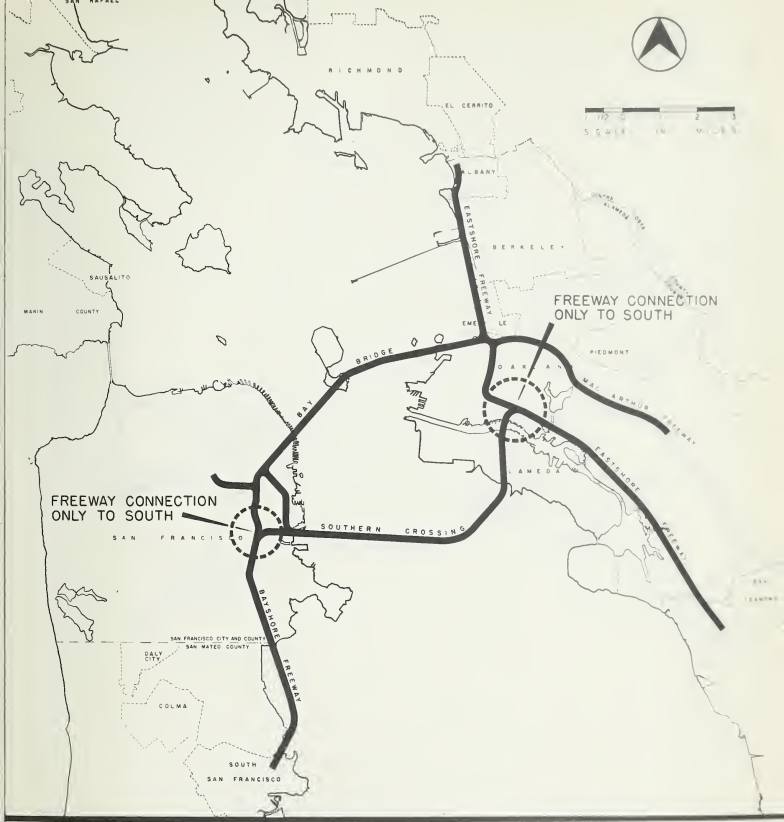
First, there will be ample capacity on the existing bridge and the Southern Crossing to accommodate all transbay traffic in the year 1970 conveniently,

Second, transbay traffic as estimated to the year 1980 is well within the practical capacity of the existing bridge and the proposed Southern Crossing, and

Third, as a practical matter, the second bay crossing can be placed at the Army Street location with the full assurance that there will be adequate capacity for transbay traffic for a generation or more.

This analysis also produces interesting figures on the relative inconvenience to motorists through diversions which would result from the location of the Second Bay Crossing in the two alternate locations now under consideration.

If the Southern Crossing is built it will be necessary to divert from the upper level of the Bay bridge an average of 2,150 vehicles daily from the route which they might normally take. If the parallel bridge is built, however, the number of vehicles which will be inconvenienced will amount to 22,500 daily. It is apparent that the adoption of the parallel bridge location will inconvenience in perpetuity ten times as many motorists as would be inconvenienced by the minor diversion to the Southern Crossing during the peak hours.



SOUTHERN CROSSING

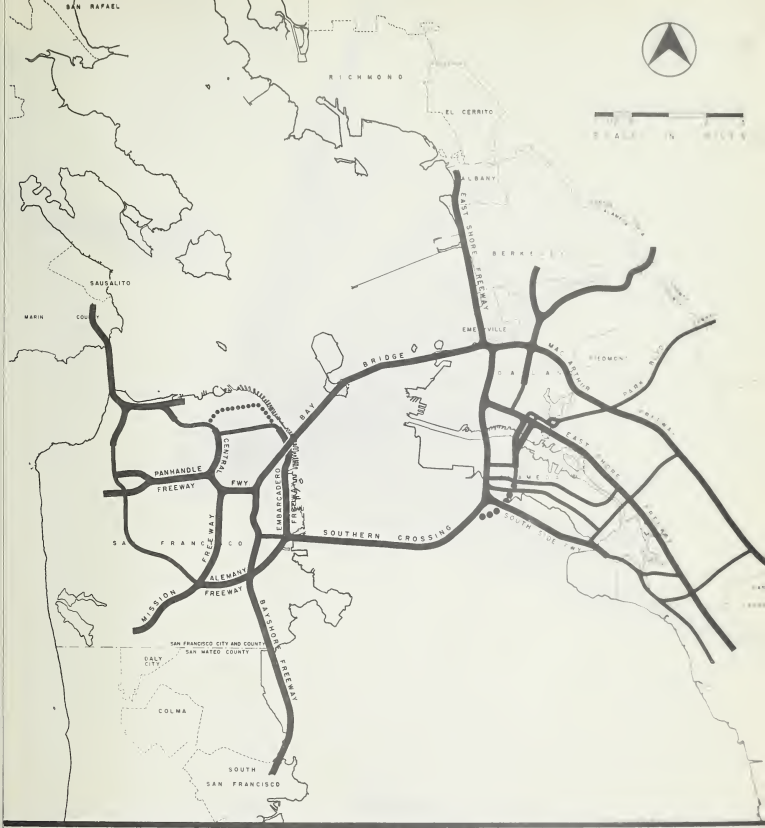
DISTRIBUTION SYSTEM PROPOSED BY STATE REPORT

CITY AND COUNTY OF SAN FRANCISCO

PREPARED BY DEPARTMENT OF CITY PLANNING – MAY 1949

ELMER E. ROBINSON, MAYOR

1



SOUTHERN CROSSING

DISTRIBUTION SYSTEM PROVIDED BY MASTER PLANS OF OAKLAND AND ALAMEDA AND PROPOSED AMENDMENTS TO SAN FRANCISCO MASTER PLAN

CITY AND COUNTY OF SAN FRANCISCO

11

PREPARED BY DEPARTMENT OF CITY PLANNING — MAY 1949

ELMER E. ROBINSON, MAYOR

TRANSBAY DESIRE LINES

1970

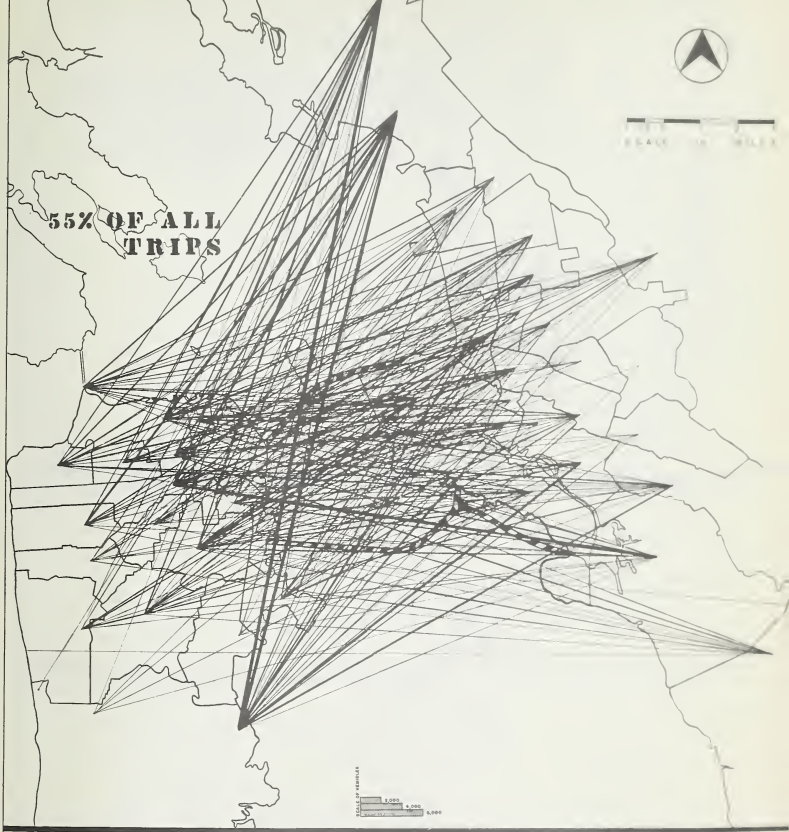
OF AUTOMOBILES TRAVELING BETWEEN
THE M.T.D. AND EAST BAY SEGMENTS

CITY AND COUNTY OF SAN FRANCISCO

PREPARED BY DEPARTMENT OF CITY PLANNING - MAY 1949

ELMER E. ROBINSON, MAYOR

III



TRANSBAY DESIRE LINES

1970

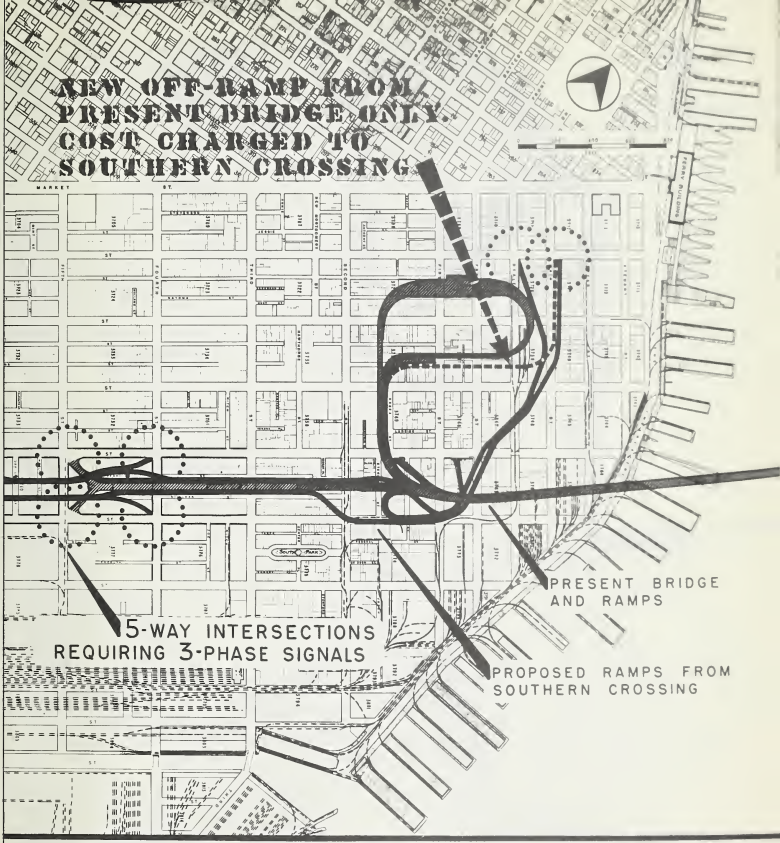
OF AUTOMOBILES TRAVELING BETWEEN SAN FRANCISCO
SEGMENTS OUTSIDE THE M.T.D. & EAST BAY SEGMENTS

CITY AND COUNTY OF SAN FRANCISCO

IV

PREPARED BY DEPARTMENT OF CITY PLANNING - MAY 1949

ELMER E ROBINSON, MAYOR


NEW OFF-RAMP FROM PRESENT BRIDGE ONLY. COST CHARGED TO SOUTHERN CROSSING
MARKET ST.
5-WAY INTERSECTIONS REQUIRING 3-PHASE SIGNALS
PRESENT BRIDGE AND RAMPS
PROPOSED RAMPS FROM SOUTHERN CROSSING

PRESENT BAY BRIDGE

FUTURE DISTRIBUTION SYSTEM SHOWING
NEW RAMPS PROPOSED IN STATE REPORT

CITY AND COUNTY OF SAN FRANCISCO

V

PREPARED BY DEPARTMENT OF CITY PLANNING – MAY 1949

ELMER E. ROBINSON, MAYOR

SAN FRANCISCO BAY AREA

AREAS SUBJECT TO FUTURE RESIDENTIAL AND INDUSTRIAL DEVELOPMENT.

CITY AND COUNTY OF SAN FRANCISCO

VII

PREPARED BY DEPARTMENT OF CITY PLANNING - MAY 1949

ELMER E ROBINSON, MAYOR

SAN FRANCISCO DEPARTMENT OF CITY PLANNING
100 LARKIN STREET SAN FRANCISCO 2 CALIFORNIA

Memorandum DATE Jan. 22, 1953

TO Hon. Dion Holm, City Attorney

FROM Paul Oppermann, Director of Planning

The enclosed printed material is forwarded to you upon request on loan from the Library of the Department of City Planning. Please return.

Contents

1. Pamphlet "The Case for the SOUTHERN CROSSING".
2. SECOND BAY CROSSING: Summary of Statement made by Chas. E. De Leuw, Transportation Consultant.
3. Letter from Director of Planning (with attached Rebuttal) dated July 25, 1949.
4. Memorandum from the Department of City Planning, dated March 13, 1952.

Per:

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CITY AND COUNTY OF SAN FRANCISCO

ELMER E. ROBINSON, MAYOR

DEPARTMENT OF CITY PLANNING

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Secretary

100 LARKIN STREET, CIVIC CENTER
SAN FRANCISCO 2, CALIFORNIA

July 25, 1949

File No.: D970

Dear Friend:

Enclosed is more information on an additional bridge across San Francisco Bay.

This is a copy of the statement by the engineering consultants to the State Legislature and is Committee made in rebuttal to the testimony by proponents of the parallel bridge.

This information is being sent to you as one person who would, in our opinion, appreciate having available authentic and well documented information regarding this subject.

Regardless of the outcome of the controversy we believe it is in the public interest to make full information on this matter available to interested persons.

Sincerely yours,

Paul Oppermann

Paul Oppermann
Director of Planning

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STATEMENT IN REBUTTAL OF TESTIMONY BY PROPONENTS OF THE PARALLEL BRIDGE

July 9, 1949

Prepared by Engineering Consultants to the California Assembly Interim Committee on Tidelands and Related Traffic Problems

A. NATIONAL AND LOCAL SECURITY FACTORS

1. If the Bay Bridge and Parallel Bridge were out of service as the result of aerial attack, sabotage, fire or earthquake, the distances that military and other vehicles would have to travel between San Francisco and Oakland would be approximately 48 miles via San Mateo Bridge, instead of only 12 miles if the Southern Crossing were built.

2. A check by Mr. Ole Singstad of the dimensions of military vehicles in the New York area in 1945 showed that all of them could pass through the Queens-Midtown Tunnel. If any exceptionally high or wide vehicles should exceed the clearances of the Southern Crossing, they could use the Bay Bridge or could be lightered across the Bay.

B. REMOVAL OF TRACKS AND SUBSTITUTION OF BUSES

1. The statement that substitution of buses for streetcars would be "unacceptable" to East Bay residents does not accord with the facts. Since the war, several streetcar routes have been abandoned in the East Bay and replaced by buses. It is not logical to anticipate indefinite continuance of streetcar trains on important downtown streets of Oakland. In many other cities, bridge streetcar tracks have been removed and buses substituted, with resulting time savings and greater convenience to the riding public.

2. Mr. Ralph Tudor claimed that it would not be practicable to accomodate the additional buses to be substituted for the interurban streetcars during the reconstruction of the lower deck.

   At present, vehicular traffic on the lower deck roadway is less than 50 percent of its capacity. The number of buses required to carry the rail passengers would add about one third to the existing maximum peak hour traffic in one direction, giving a total of about 66 percent of capacity. It is therefore not conceivable that this addition would cause congestion on the existing roadway pending the replacement of the tracks by two additional lanes roadway pavement, if such replacement is undertaken within the next ten years.

Statement of Position of
[illegible] on the Issue of Water

Purposes of Discussion Only--January, 1971 for California Assembly Interim
Committee on Criminal and Civil Procedure Traffic Problems

A. Methods and Issue Clarification Process

1. If [illegible] police may [illegible] out of service
   in the county of their primary employer like on weekends,
   there, the discussion does not clearly [illegible]
   [illegible] this to avoid [illegible] and confusion
   would be unnecessarily [illegible] all [illegible]
   [illegible] of only if [illegible] the [illegible]
   [illegible].

2. A check of all the [illegible] of the [illegible] is [illegible]
   available in the [illegible] some [illegible] all or
   some could [illegible] [illegible] [illegible].
   [illegible] [illegible] [illegible] should [illegible]
   [illegible] of [illegible] [illegible] [illegible] was the
   way to [illegible] [illegible] [illegible].

B. Methods of Issue Identification or Study

1. The following [illegible] [illegible] [illegible]
   would be "[illegible]" to [illegible] [illegible]
   [illegible] [illegible] [illegible] [illegible]
   [illegible] [illegible] [illegible] [illegible]
   [illegible] [illegible]

C. TRAFFIC ESTIMATING PROCEDURE

1. The statement by Assemblyman Robert McCarthy that Mr. George Burpee did not take the routes of traffic into consideration, but merely used origins and destinations, reveals ignorance or lack of understanding of the procedure described by Mr. Burpee in his testimony. Mr. Burpee's calculations of distance savings, time savings and resultant allocations of traffic between the Bay Bridge and Southern Crossing were all based on routes existing or to be constructed in accordance with Mr. Tudor's plans and the plans of the State Highway Division. See pages 97 to 101 of Coverdale & Colpitts report of November 1, 1948.

2. Mr. Tudor stated that if the Southern Crossing were built it would convenience only 18 per cent of the traffic; and "a large share of the remaining 82 per cent would be inconvenienced by congestion on the Bay Bridge." This statement ignores our recommendation that the Bay Bridge be reconstructed to increase its capacity. No traffic even in peak hours 40 or more years from now, would be inconvenienced by congestion.

3. Mr. Burpee allocated 99 percent of the traffic to and from the Piedmont section of the East Bay Area to the Parallel Bridge. Computation by Mr. McCrosky, making allowance for improved approaches to the Southern Crossing, gave a figure of 80 percent. The public opinion survey subsequently conducted by John B. Knight Company revealed a driver preference of only 70 per cent for the Parallel Bridge route.

D. APPROACHES

1. On two occasions in his testimony, Mr. Tudor stated that "one of the consultants to the Dolwig Committee" had testified in California that the Tudor approaches would "take care of the traffic." We have no recollection or record of any such testimony, except insofar as it might apply only to the capacity of the Parallel Bridge elevated approach structures on the Oakland side. Our report of June 1, 1949 states (page 30): "the whole question of approaches to the recommended Southern Crossing merits thorough reanalysis." We consider that the combined system of approaches for the Parallel Bridges and Southern Crossing in San Francisco, as prepared by Mr. Tudor, is based on erroneous concepts and is deficient from a design standpoint.

2. Mr. Tudor's statement, "there would be no difference in the congestion regardless of where we build a crossing," is presumably his conclusion based upon his design for the

system of approaches. With a better system of approaches, his statement would not hold true. Poor approaches cause and magnify congestion on a few critical local streets. Good approaches obviate congestion by spreading out the traffic load so that it can reach its ultimate destinations by utilizing many local streets.

3. Mr. Tudor stated that provision for turning movements to and from the north, at the junction of Army Street and Bay Shore Freeway, would congest the Bay Shore Freeway. We pointed out to him in cross-examination at Sacramento that such congestion could be obviated, if necessary, by adding two lanes to this freeway for the short distance from Army Street to Division Street. A considerable area in this section of San Francisco cannot be reached by express facilities, under Mr. Tudor's plan. Traffic to and from that area was therefore allocated by Mr. Burpee to the Bay Bridge, whereas, it would, with proper approaches, logically use the Southern Crossing.

4. Mr. Tudor's statement, "there would be no increase in Southern Crossing traffic volume if the northward approach turns were built in San Francisco and Oakland" does not accord with the traffic allocation procedure used by Mr. Burpee, and described in the latter's testimony, nor with any rational analysis of traffic movements.

5. Mr. Tudor stated on July 7 and again on July 9 that we should have allowed an additional $11,000,000 or $11,500,000 for approaches as part of our Step 1, including his 22nd Street Oakland approach. This 22nd Street viaduct is not properly a part of Step 1. We included it in Step 3, where it belongs. Our cost allowance was:

Construction	$6,000,000.
Contingencies & Engineering	800,000
Total, excluding Land,	$6,800,000

The above figures are taken from Mr. Tudor's report. We included a combined estimate for the land cost of all approaches, using Mr. Tudor's estimates as a guide. No separate land figures, for each approach, are given in Mr. Tudor's report.

In Steps 1, 2 and 3, we made appropriate allowance for other necessary approaches. It would be duplication to include an additional $11,500,000 in any of the three Steps.

6. A statement was made by Mr. Leland Kaiser to the effect that the Southern Crossing would remove twice as much property from the tax rools as the Parallel Bridge. This statement seems to have been refuted by Mr. Tudor's testimony, in w hich he cited the following figures:

	Acres	Assessed Value
Parallel Bridge	35.7	$448,000.
Southern Crossing, Tudor design	30,9	561,000.
Southern Crossing, Consultant's design	39.4	601,000.

We have not attempted to check Mr. Tudor's computations of these figures.

E. RECONSTRUCTION OF EXISTING BRIDGE

1. In his rebuttal on July 9th, Mr. Tudor argued again that a width of 21 feet for two-lane roadways carrying only passenger cars was substandard. On the existing Transbay Bridge the width of two lanes is 19.4 feet. The most modern long vehicular tunnels (Lincoln Tunnel under Hudson River, Queens-Midtown and Brooklyn-Battery Tunnels under East River) and a number of large bridges have two-lane widths for mixed truck, bus end passenger car traffic of between 20 ft. and 22 ft. Since passenger cars are generally not over 6-1/2 ft. wide, whereas buses and trucks are from 8 to 9 ft. wide, we consider that a width of 21 ft. for two-lane passenger car roadways is adequate.

However, it is entirely feasible to increase the width of the upper deck roadways to 22 feet or more, without exceeding the present total load on the bridge. We consider any width in excess of 22 feet for two land roadways carrying passenger cars only to be unnecessary and wasteful.

Mr. Tudor cited the American Association of State Highway Officials Standard as calling for 24 or more feet width for two lanes. This standard applies to mixed traffic roadways carrying traffic in both directions. It does not apply to roadways carrying only passenger cars, and only in one direction.

2. Mr. Tudor stated that he would be concerned about increasing the stresses in the towers over those now existing, particularly in view of the possibility of severe earthquake stresses. Inasmuch as Mr. Ammann in his testimony on July 9th explained that it is possible to reconstruct the bridge without exceeding the safe stresses assumed for the design of the existing bridge, Mr. Tudor's argument has no significance.

F. OPERATION OF EXISTING BAY BRIDGE

1. We are not in agreement with a statement made in testimony to the effect that the existing Bay Bridge is "very efficiently operated." Present congestion could be reduced and safety enhanced by many simple traffic engineering expedients that have not been applied.

G. FINANCING OF CONSULTANTS' PLAN

1. Our proposal consists of three separate construction steps, as explained in Mr. T. T. McCrosky's testimony. These three steps can be financed in different years, or the first two steps but not the third could be combined in one financing operation.

   At no time has it been suggested by us that all three steps should be financed simultaneously, as was intimated by Mr. Kaiser on July 9th.

2. Our proposal is summarized in the following table:

1st Step - Lower Deck Reconstruction

Capacity Adequate till 1957
Start negotiations with Key System at once.
Financing in March 1950.
Actual removal of tracks and their replacement by a two-lane pavement can be accomplished in one season.

Construction and Real Estate	$19,000,000	
Outstanding Bonds	20,505,125	
Repayment of Debt to State	6,288,550	
Less present Capital Reserve	- 4,000,000	
Total First Step		$41,793,675

2nd Step - Four Lane Southern Crossing

Alternate A - Financing in March 1950
Completion in 1955

Construction & Real Estate	$148,500,000	
Operating Reserve	4,000,000	
Total 2nd Step		$152,500,000
Total 1st & 2nd Steps, simultaneous financing (round figure)		$194,300,000

This total is believed to be within financing capacity at a 25 cent toll, in the light of testimony from various sources.

Alternate B - Financing in March 1952. Completion 1957

By deferring the start of Step 2 until 1952, there would be, by then, additional bonds paid off in the amount of approximately - 15,500,000 -15,500,000

Required Financing and Refinancing in 1952 (round figure) $178,800,000

This amount, $178,800,000, is well within the latest estimates of practicable financing at a 25 cent toll.

3rd Step - Upper Deck Reconstruction

Financing in March 1955 (or in 1957 if Alternate B is adopted). Completion in 1957 (or 1959).

Total Construction and Real Estate 36,000,000

3. Our estimate in the above table include proper allowances for contingencies, engineering, interest during construction, and legal and insurance costs during construction.

4. In testimony at Sacramento, the Operating Reserve for the Southern Crossing was variously predicted at $10,000,000, $4,000,000 and Zero. On July 9th, Mr. Kaiser used a figure of $8,000,000. We have used $4,000,000 in our table.

5. On July 9, Mr. Kaiser suggested the possible need for an "Insurance Reserve" separate from the Operating Reserve. He stated no figure for its size.

No estimates presented in the Tudor Report, for either the Parallel Bridge or the Southern Crossing, include any provision for a separate "Insurance Reserve."

In the light of Mr. Tudor's thorough prior investigation of the whole insurance problem, it is believed that he was correct in omitting an "Insurance Reserve."

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It is respectfully requested that this rebuttal statement be considered as supplementary to the basic testimony given by us on July 9th, and that it be made a part of the record.

New York N. Y.

July 12, 1949

T. T. McCrosky

O. H. Ammann

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SECOND BAY CROSSING:
SUMMARY OF STATEMENT MADE BY CHARLES E. DE LEUW, TRANSPORTATION CONSULTANT, AT THE LEGISLATIVE COMMITTEE HEARING IN SACRAMENTO ON May 9, 1949.

Previous statements made to your Committee have developed the fallacies in certain of the assumptions made by the Division of San Francisco Bay Toll Crossings of the California Department of Public Works on which the traffic estimates of Coverdale & Colpitts, Consulting Engineers of New York City, were based.

Mention has been made of the failure to include the entire metropolitan area in the Bay Area Metropolitan Traffic Survey conducted by the State Highway Department in cooperation with the Public Roads Administration in 1946 and 1947. Mention has also been made of the presumption that there would be no improvements in public transit facilities as now operated, and that traffic on existing transbay transit facilities would remain at the present level. Emphasis has also been given to the fact that the Coverdale & Colpitts traffic estimates were developed in the absence of any long range or comprehensive plans for highway development in the metropolitan area and that - as a matter of fact - the interchanges with the rather meagre pattern of freeways which was utilized in these estimates were so designed as to discourage the use of the Southern Crossing.

I will not attempt to enlarge here on these important matters but will limit my statement to your Committee to my own analysis of the capacity and use of the existing bridge and the proposed Southern Crossing.

I desire to make it entirely clear that my comments are not to be construed as any reflection on the very excellent engineering organization of the California Division of Highways. Neither is there any reflection on the high professional standing and competence of the firm of Coverdale & Colpitts. We have reviewed in some detail the methods utilized in the BAMTS, and have had available for our use many of the data developed in that survey from which we can state that the survey was conducted in an efficient and capable manner so that complete confidence may be placed in the basic data developed.

Similarly, we have reviewed the techniques and procedures utilized by Messrs. Coverdale & Colpitts as described in their report of November 1, 1948, and find that we are generally in accord not only with the techniques utilized in the estimates of traffic but also in their projections of future trends. We have, however, as previously stated, certain criticisms of the basic assumptions utilized in developing these traffic estimates. More important, perhaps, are the differences in the conclusions reached by Coverdale & Colpitts and myself in respect to the capacity and use of the two crossings, and I will attempt to develop this point in some detail.

In order to avoid confusion I will utilize the allocation of traffic between the existing bridge and the Southern Crossing as well as the projections of traffic increases to the year 1970 as made by Coverdal & Colpitts. In the following discussion all references to estimates and page numbers will be to those appearing in Messrs. Coverdale & Colpitts Report of November 1, 1948.

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Total revenue vehicles in 1970 are estimated at 38,469,000 (see page 40). On page 70, it was stated that total vehicles - including both revenue and non-revenue vehicles - would be determined by dividing total revenue vehicles by 0.975. Making the reasonable assumption that this relationship will remain, it may be determined that the total vehicles during the year 1970 will amount to 39,500,000.

On page 70, light passenger vehicles utilizing the upper deck of the existing bridge were stated to be 90.61% of the total traffic. Making the reasonable assumption that this ratio will remain constant it may be determined that the total light passenger cars in the year 1970 will be 35,700,000, and that buses and trucks will total 3,800,000.

In the table opposite page 109 summarizing the Coverdale & Colpitts estimates, it was stated that 17.9% of the total traffic will utilize the Southern Crossing on "basis of present pattern, and time and distance saving." They also estimated additional traffic over the Southern Crossing resulting from "other diversions from zone-to-zone movements where time-saving may not be the sole determinant" at 831,000 cars or 2.2% of total. Thus, the total traffic over the Southern Crossing was estimated at 20.1%. My estimate of the total use of the two crossings is shown in the following tabulation:

	Existing Bridge	Southern Crossing
Light Passenger Cars	28,500,000	7,200,000
Induced Traffic°	-	240,000
Trucks and Buses	3,030,000	770,000
	31,530,000	8,210,000

°From tabulation opposite page 109

The relationship between total annual traffic and normal week-day traffic was summarized on pages 50 and 51 of the report, where normal week-day light passenger car traffic was stated to be 1/370 of the total annual traffic, and normal week-day bus and truck traffic 1/300 of the total annual traffic. Applying these factors to the figures for total annual traffic in the year 1970 previously discussed, it is determined that average week-day light passenger car traffic in the year 1970 will total 97,000 vehicles, and that the average week-day truck and bus traffic in the year 1970 will total 12,500 vehicles. Allocating 20.1% of the traffic to the Southern Crossing it develops that there would normally be 77,000 light passenger cars and 10,000 trucks and buses - a total of 87,000 vehicles over the present bridge. Similarly, there would be 20,000 light passenger cars and 2,500 trucks and buses, a total of 22,500 over the Southern Crossing.

Exhibit R-2 shows a graph of hourly directional traffic based on traffic counts made on the upper deck of the existing bridge on three week days in 1948, and was used as a basis for the determination of peak hour traffic conditions at the 1970 traffic level. (This will produce slightly higher figures for peak hour traffic than may be reasonably presumed due to the tendency of these curves to flatten with increases in traffic as stated in the report). Maximum hourly traffic reaches a peak during the eastbound p.m. period of 6% of the twenty-four hour total. Bus and truck traffic reaches a similar peak of 5%. Applying these percentages to the average 1970 week-day traffic, we find that

the maximum traffic in one direction in a single hour over both crossings will total approximately 5,800 light passenger cars. However, 20.1% will be diverted to the Southern Crossing so as to reduce this peak flow over the existing bridge to approximately 4,600 light passenger cars, and during the same hour the flow over the Southern Crossing would be 1,200 light passenger cars.

Messrs. Coverdale & Colpitts stated the practical capacity of three lanes of the upper deck of the existing bridge to be 4,200 vehicles per hour and the "comfortable" capacity to be 3,000 vehicles per hour. In view of the known peak figures on the present bridge of more than 4,400 vehicles per hour; of the higher rates of traffic flow both on the existing bridge and in many other localities for shorter periods ranging up to 2,000 vehicles per lane per hour, it is my opinion that the figures utilized by Coverdale & Colpitts are unreasonably conservative. It is my opinion that 1,200 vehicles per lane or a total of 3,600 vehicles per hour is a more reasonable assumption as to the comfortable capacity of three lanes on the present bridge structure.

Utilizing this figure and applying it to an enlargement of Exhibit R-2 (attached hereto) it may be determined that a diversion of light passenger cars to the Southern Crossing during the evening peak period of 1,325 vehicles and during the morning peak period of 825 vehicles would limit the 1970 use of the upper deck to the comfortable capacity of that structure as now operated.

During the maximum hour of the same eastbound peak period the flow over the Southern Crossing in the eastbound direction would amount to 6% of 20,000 light passenger cars or 1,200 vehicles plus 5% of 2,500 trucks and buses or 125 plus 1,025 light passenger cars diverted from the existing bridge, making a total of 2,350 vehicles in the eastbound direction. This amounts to an average of 783 vehicles on each of the three lanes proposed for the causeway and an average 588 vehicles for each of the four lanes in the tunnels. These figures are well within the limit of the capacity of the Southern Crossing.

In the westbound direction during the same evening peak hour period, the total traffic as developed from the same curves would amount to only 890 vehicles which is an average of 297 vehicles on each of the three lanes available on the causeway, and an average 445 vehicles on each of the two lanes available through the tunnel section.

Estimates to the year 1980 have been made, based on curves projected by Messrs. Coverdale & Colpitts, which establish the increments to traffic during this ten year period at approximately 13 percent. Thus the total eastbound traffic during the evening peak period is estimated as follows:

Crossing	Maximum Hour Traffic - 1980 Total	Per Lane
Existing Bridge	3,600	1,200
Southern Crossing	3,124	
Causeway Section		1,041
Tunnel Section		781

A comparison of traffic flow through the Posey Tube in Alameda during the year 1947 with that estimated by Messrs. Coverdale & Colpitts for the year 1970 for the Southern Crossing is shown in the following tabulation:

Tunnel	Number of Lanes	Maximum Hourly Traffic			24-Hour Total
		Heavy Direction		Total	
		Total	Per Lane		
Posey Tube	2	1,178	1,178	2,201	28,000
Southern Crossing	6	2,350	588°	3,240	24,650

°Four lanes available during rush hour.

Certain facts became clear from the foregoing analysis, as follows:

First, there will be ample capacity on the existing bridge and the Southern Crossing to accommodate all transbay traffic in the year 1970 conveniently,

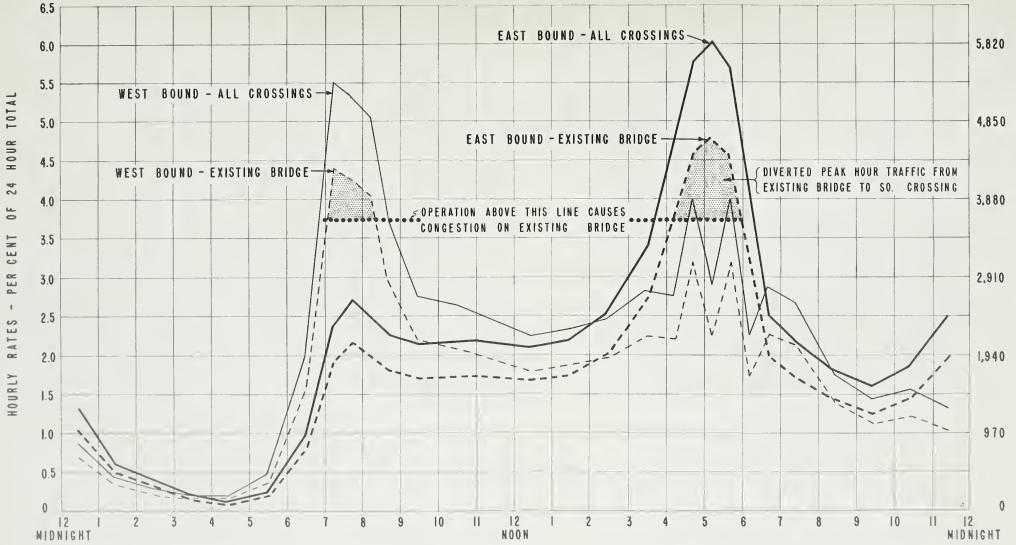
Second, transbay traffic as estimated to the year 1980 is well within the practical capacity of the existing bridge and the proposed Southern Crossing, and

Third, as a practical matter, the second bay crossing can be placed at the Army Street location with the full assurance that there will be adequate capacity for transbay traffic for a generation or more.

This analysis also produces interesting figures on the relative inconvenience to motorists through diversions which would result from the location of the Second Bay Crossing in the two alternate locations now under consideration.

If the Southern Crossing is built it will be necessary to divert from the upper level of the Bay bridge an average of 2,150 vehicles daily from the route which they might normally take. If the parallel bridge is built, however, the number of vehicles which will be inconvenienced will amount to 22,500 daily. It is apparent that the adoption of the parallel bridge location will inconvenience in perpetuity ten times as many motorists as would be inconvenienced by the minor diversion to the Southern Crossing during the peak hours.

Source	Degrees of Freedom	Sum of Squares	Mean Square	F	Prob.
Among Trees	5	0.2178	0.0436	0.84	0.5
Within Trees	6	0.3120	0.0520		



ESTIMATED 1970 HOURLY PASSENGER VEHICULAR FLOW

FOR EXISTING BRIDGE AND SOUTHERN CROSSING

SHOWING ALSO THAT THE EXISTING BRIDGE CAN OPERATE BELOW THE CONGESTION LINE BY DIVERTING A RELATIVELY SMALL AMOUNT OF TRAFFIC DURING THE PEAK HOUR TO THE SOUTHERN CROSSING

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MEMORANDUM

From: City Planning Commission
Subject: Southern Bay Crossing

With renewed active discussion being given currently in the State Legislature to the problem of additional Bay crossings, it seems pertinent at this time for the City Planning Commission to restate and reaffirm its recommendations.

The adopted Master Plan recommends in the Southern Bay area a Bay crossing with its San Francisco bridgehead at Army Street. This is the "southern crossing" route which has been advocated by the City Planning Commission since the report of the Joint Army-Navy Board recommended this location in 1947, and which has been officially supported by the Mayor and Board of Supervisors.

The primary reasons for favoring a crossing in this location are logical and clear:

1. It will permit a distribution system in San Francisco that will disperse vehicular traffic over the entire system of streets and over many surface streets rather than concentrating the entire bay traffic load on a few arteries. The essential element in the distribution system for a southern crossing is the Embarcadero Freeway with ramps leading to and from surface streets entirely separate from those serving the existing bridge. This is shown in Plates II and VI of the report prepared in 1948 on "The Case for the Southern Crossing".

2. A crossing at the Army Street location will fit best into a dispersed system of Bay crossings. Dispersal is important not only in order to prevent or minimize traffic congestion, but in order to avoid congestion and concentration of new land development and traffic generating uses. Plate VII of "The Case for the Southern Crossing" shows the areas on both sides of the Bay in which new residential and industrial development can take place.

Dispersal of Bay crossings is also extremely important as to interests of defense.

3. The Bay crossing problem is not simply a problem of moving vehicles, but of moving people, and greatly improved public transit is the major means of meeting this problem. Solution to this problem requires area-wide cooperation, and the Bay Area Rapid Transit Commission recently appointed by the Governor and Bay Area Boards of Supervisors, has been created by the State Legislature to study this problem. A crossing at Army Street will not conflict with any transit system developed to connect the centers of population on either side of the Bay; rather, a crossing at this location will supplement the existing system and an adequate transit system.

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